

TrustNShare: Development of a Blockchain-Based Data Trust Model for Secure and Controlled Health Data Sharing Grounded on Empirical Research

Hamza MAATOUK^{a,1}, Sebastian USCHMANN^b, Sven FESTAG^b, Tim SCHNEIDER^b, Anna WEBER^c, Ngo Manh KHOI^c, Sven BOCK^c, Stephan M. JONAS^a, Cord SPRECKEISEN^b and Friederike KLAN^c

^a*Institute of Digital Medicine, University Hospital Bonn, Bonn, Germany*

^b*Institute of Medical Statistics, Computer and Data Sciences (IMSID), Jena University Hospital*

^c*German Aerospace Center (DLR), Institute of Data Science*

ORCID ID: Sven Festag <https://orcid.org/0000-0002-2507-5901>, Stephan M. Jonas <https://orcid.org/0000-0002-3687-6165>, Cord Spreckelsen <https://orcid.org/0000-0002-7301-1566>, Friederike Klan <https://orcid.org/0000-0002-1856-7334>

Abstract. Ensuring data quality and protecting data are key requirements when working with health-related data. Re-identification risks of feature-rich data sets have led to the dissolution of the hard boundary between data protected by data protection laws (GDPR) and anonymized data sets. To solve this problem, the TrustNShare project is creating a transparent data trust that acts as a trusted intermediary. This allows for secure and controlled data exchange, while offering flexible datasharing options, considering trustworthiness, risk tolerance, and healthcare interoperability. Empirical studies and participatory research will be conducted to develop a trustworthy and effective data trust model.

Keywords. Smart contracts, data trust, incentives

1. Introduction

Sharing health data is crucial for clinical decision-making, care coordination, and public health initiatives. New techniques like differential privacy and distributed privacy-preserving computing offer more control over the flow of information [1]. But current data trust models lack transparency, making it difficult to fine-tune trustworthiness, risk tolerance, and data release criteria [2]. The TrustNShare project aims to create a transparent and flexible data trust model using blockchain and smart contracts to facilitate secure and controlled data exchange, encouraging data sharing and promoting optimal use scenarios for health data [3].

¹ Corresponding author: Hamza Maatouk, Institute of Digital Medicine, Faculty of Medicine, Venusberg Campus 1, Building 74, 53127 Bonn. Email: Hamza.Maatouk@ukbonn.de.

2. Methodology

A research approach aimed at developing incentives for a data trust model with a focus on Munich and Bonn municipalities in Germany. The structure and context of the model are shown in Figure 1. Students from Technical University of Munich and University of Bonn will be involved in the project as potential data donors. The data trust will assess the perceived reliability of data consumers using a reputation model based on trust factors identified through empirical studies conducted in the project. The level of data released will be determined based on the recipient's trustworthiness, reputation, and possible incentives. To ensure secure and automated data trust services, Hyperledger blockchain and smart contracts will be used.

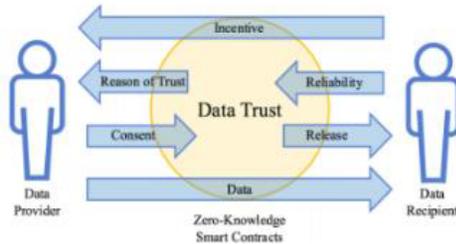


Figure 1. Schematic view of the data trust model.

3. Results

The expected result of the project is a transparent data trust model that provides a fine-tuned balance between the level of data release, trustworthiness, and risk tolerance. The model will be grounded on effective incentives stimulating data sharing and empirical findings on relevant factors affecting perceived trust in data consumers.

4. Discussion and Conclusions

TrustNShare will utilize blockchain and smart contracts to develop a transparent data trust model that promotes trustworthiness and risk tolerance, improving healthcare interoperability through a participatory research process involving key stakeholders.

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